



WATER RESOURCES RESEARCH GRANT PROPOSAL

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Title: Identifying Reference Stream Reaches for Comprehensive bioassessment

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Abstract

A methodology to classify all streams in Missouri as to their biological distinctiveness and conservation status is nearing completion. This Geographical Information System-based method encompasses 8 hierarchical spatial levels nested at ever-finer resolution. Such a system has potential to organize stream biomonitoring programs, select streams for conservation or preservation, and to aid in the experimental design of field experiments. A key aspect of biological assessment and monitoring programs is the selection of "reference" sites (i.e., the least impaired) which serve as benchmarks, and to which the biota of all other reaches of streams in that area of the state are compared. The objective of this study is to field validate the usefulness of this methodology in selecting reference stream reaches. The biota of interest for the validation will be crayfish. The 32 species of crayfish in Missouri are widely distributed, ecologically very important, and in peril - over 50 % are listed by the state as being in actual or potential need of protection. Selection of potential reference stream reaches using the GIS methodology will be followed by quantitative field collections of crayfish populations. Analyses will be made to determine whether the classification hierarchy is an appropriate means to consistently distinguish reference crayfish communities. Successful validations using crayfishes would allow us to pursue more extensive validations using fishes and benthic invertebrates and ultimately develop sensitive biocriteria for the state.